【DECLARATION】

Thanks for purchasing our Electronic Speed Controller (ESC). The power system for RC model can be very dangerous, so please read this manual carefully. In that we have no control over the correct use, installation, application, or maintenance of our products, no liability shall be assumed nor accepted for any damages, losses or costs resulting from the use of the product. Any claims arising from the operating, failure of malfunctioning etc. will be denied. We assume no liability for personal injury, consequential damages resulting from our product or our workmanship.

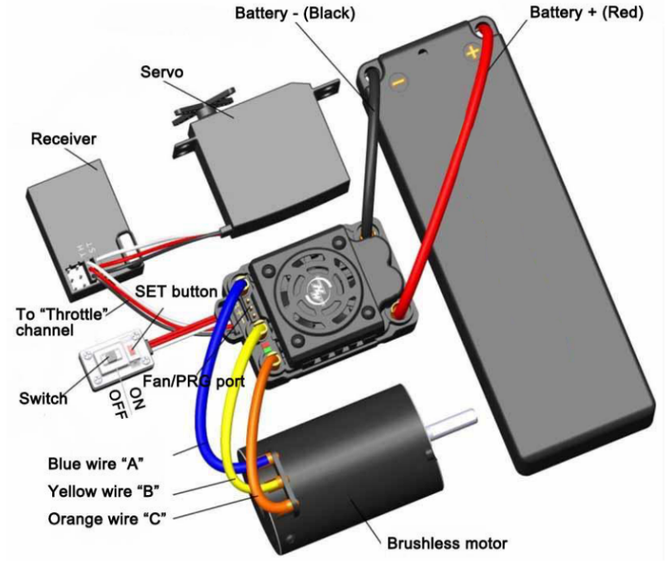
【FEATURES】

- ★ Completely water-proof and dust-proof. The ESC works properly even under water.
  (Please remove the cooling fan when running car in water, and after running, please make the ESC clean and then dry it to avoid the oxidation of copper connectors)
- ★ Excellent start-up, acceleration and linearity features, suitable for truggy (especially short course trucks) and buggy.
- ★ The built-in switching mode BEC of GROUND-WP-SC8 has a powerful output to supply all electronic equipments.
- ★ There is a mounting stand for installing the ESC on chassis easily and firmly.
- ★ Proportional ABS brake function with 5 steps of maximum brake force adjustment, 8 steps of drag-brake force adjustment and 4 steps of initial brake force adjustment. Also compatible with the mechanical disc-brake system.
- ★ Multiple protection features: Low voltage cut-off protection / Over-heat protection / Throttle signal loss protection / Motor blocked protection
- ★ Easily programmed with the SET button of the ESC, and also compatible with pocket-sized Program Card (Optional equipment) and the advanced LCD Program Box (Optional equipment).
- ★ Special program port for connecting to the LED Program Card or the LCD Program Box. User needn't unplug the Rx lead from receiver when programming the ESC.
- ★ ESC firmware can be updated through an USB adapter on the LCD Program Box (Optional equipment).

【SPECIFICATIONS】

Model	GROUND-SC10	GROUND-WP-SC8
Cont./Burst Current	80A / 520A	120A / 760A
Suitable Motor	Sensorless brushless motors	
Suitable Car	1/10 SCT/Truggy / Buggy /Monster	1/10 SCT/Truggy / Buggy /Monster 1/8 SCT / Buggy (Includes TRAXXAS 1/10 Truggy and Buggy)
Motor Turns	2S Lipo : KV≤6000 3S Lipo : KV≤4000	2S Lipo : KV≤6000 3S Lipo : KV≤4000 4S Lipo : KV≤3000
Resistance	0.0007 ohm	0.0004 ohm
Battery	6-9 cells Ni-xx (NiMH or NiCd) 2-3S Li-Po	6-12 cells Ni-xx (NiMH or NiCd) 2-4S Li-Po
BEC Output *Note 1*	6V/3A (Linear mode built-in BEC)	6V/3A (Switching mode built-in BEC)
Dimension	59.3(L) × 38.4(W) × 33.6(H)	
Weight	110g (With 12AWG 200mm * 5 wires)	113g (With 12AWG 200mm * 5 wires)

NOTE1 *: The cooling fans of ESC is supplied by the built-in BEC, so it is always working under 6V .*



【BEGIN TO USE THE NEW ESC】

WARNING! THIS BRUSHLESS SYSTEM IS VERY POWERFUL! FOR SAFETY, PLEASE ALWAYS KEEP THE WHEELS AWAY FROM THE TRACK WHEN YOU BEGIN TO SWITCH ON THE ESC.

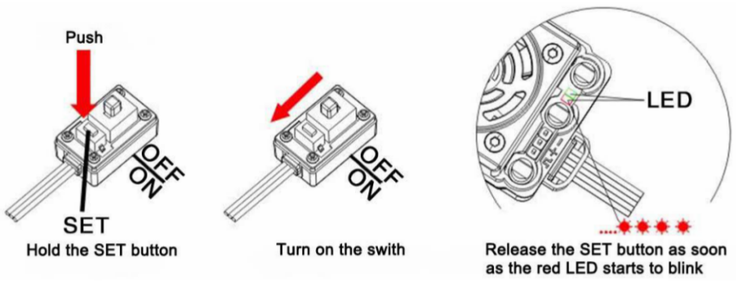
1. Connect The ESC, Motor, Receiver, Battery And Servo

The #A, #B, #C wires of the ESC can be connected with the motor wires freely (without any sequence). If the motor runs in the opposite direction, please swap any two wire connections.

2. Throttle Range Setting (Throttle Range Calibration)

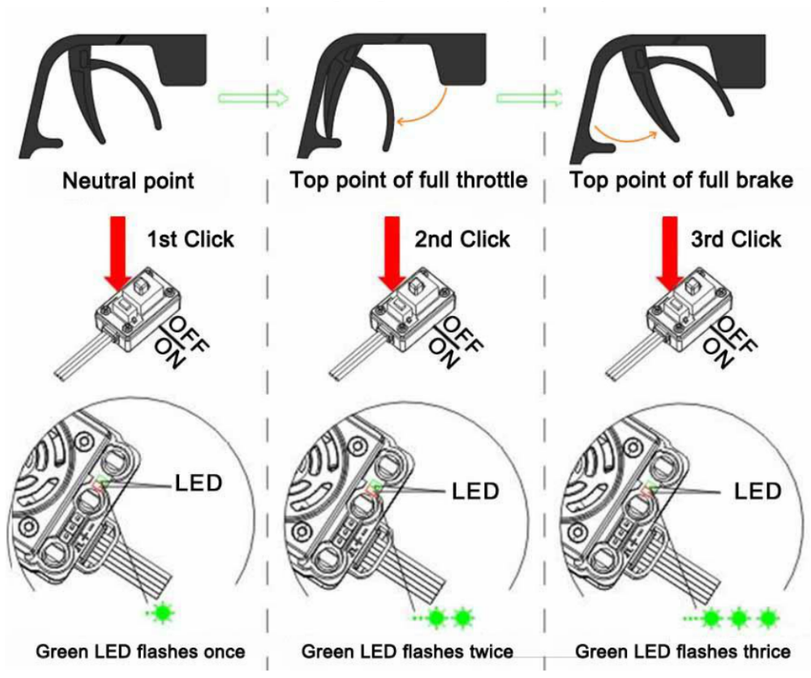
In order to make the ESC match the throttle range, you must calibrate it when you begin to use a new ESC, or a new transmitter, or change the settings of neutral position of the throttle stick, ATV or EPA parameters, etc. Otherwise the ESC cannot work properly.
The following pictures show how to set the throttle range with a **Futaba**™ transmitter.

A) Switch off the ESC, turn on the transmitter, set the direction of throttle channel to "REV", set the "EPA/ATV" value of throttle channel to "100%", and disable the ABS function of your transmitter.
B) Hold the "SET" key and then switch on the ESC, and release the "SET" key as soon as possible when the red LED begins to flash. (***Note2***)



Note2: *If you don't release the "SET" key as soon as the red LED begins to flash, the ESC will enter the program mode, in such a case, please switch off the ESC and re-calibrate the throttle range again from step A to step D.*

C) Set the 3 points according to the steps shown in the pictures on the right side.
1) **The neutral point**
Move the throttle stick at the neutral point, and then click the SET key, the green LED flashes 1 time.
2) **The end point of forward direction**
Move the throttle stick at the end point of forward direction, and then click the SET key, the green LED flashes 2 times.
3) **The end point of backward direction**
Move the throttle stick at the end point of backward direction, and then click the SET key, the green LED flashes 3 times.
D) Throttle range is calibrated; motor can be started after 3 seconds.



3. Check The LED Status In Normal Running

- ► Normally, if the throttle stick is located in the neutral range, neither the red LED nor the green LED lights.
- ► The red LED lights when the car is running forward or backward and it will flash quickly when the car is braking.
- ► The green LED lights when the throttle stick is moved to the top point of the forward zone.

4. Check The Lipo Cells Setting If You Are Using Lithium Battery

If you are using Lipo battery, we strongly suggest setting the programmable item # 11 --- "Lipo Cells" manually to avoid the over-discharge problem. Please read the instructions on page 2.
In normal case, when the ESC is switched on, the motor will emit several "Beep" tones to express the cells amount of the battery pack. For example, "Beep-Beep-" means 2S Lipo, "Beep-Beep-Beep-" means 3S Lipo, etc.

【PROGRAMMABLE ITEMS LIST】(*The italics texts in the following form are the default settings*)

Programmable Items	Programmable Value								
	1	2	3	4	5	6	7	8	9
Basic Items									
1. Running Mode	Forward with Brake	***Forward/Reverse with Brake***	Forward and Reverse						
2.Drag Brake Force	***0%***	5%	10%	20%	40%	60%	80%	100%	
3.Low Voltage Cut-Off Threshold	Non-Protection	2.6V/Cell	2.8V/Cell	3.0V /Cell	***3.2V /Cell***	3.4V /Cell			
4.Start Mode(Punch)	Level1	Level2	Level3	Level4	***Level5***	Level6	Level7	Level8	Level9

(Continued with the form at page 1)

Programmable Items	Programmable Value								
	1	2	3	4	5	6	7	8	9
Advanced Items									
5.Max Brake Force	25%	***50%***	75%	100%	Disable				
6.Max Reverse Force	***25%***	50%	75%	100%					
7.Initial Brake Force	***= Drag Brake Force***	0%	20%	40%					
8.Neutral Range	6% (Narrow)	***9% (Normal)***	12% (Wide)						
9.Timing	0.00 °	3.75 °	7.50 °	11.25 °	***15.00 °***	18.75 °	22.50°	26.25°	
10.Over-heat Protection	***Enable***	Disable							
11.Motor Rotation	***Counter Clockwise***	Clockwise							
12.Lipo Cells	***Auto Calculate***	2 Cells	3 Cells	4 Cells					

Programmable Values

1.1. **Running Mode:** In “Forward with Brake” mode, the car can go forward and brake, but cannot go backward, this mode is suitable for competition; “Forward/Reverse with Brake” mode provides backward function, which is suitable for daily training.

Note: “Forward/Reverse with Brake” mode uses “Double-click” method to make the car go backward. When you move the throttle stick from forward zone to backward zone for the first time (The 1st “click”), the ESC begins to brake the motor, the motor speeds down but it is still running, not completely stopped, so the backward action is NOT happened immediately. When the throttle stick is moved to the backward zone again (The 2nd “click”), if the motor speed is slowed down to zero (i.e. stopped), the backward action will happen. The “Double-Click” method can prevent mistakenly reversing action when the brake function is frequently used in steering.

By the way, in the process of braking or reversing, if the throttle stick is moved to forward zone, the motor will run forward at once.

“Forward/Reverse” mode uses “Single-click” method to make the car go backward. When you move the throttle stick from forward zone to backward zone, the car will go backward immediately. This mode is usually used for the Rock Crawler.

1.2. **Drag Brake Force:** Set the amount of drag brake applied at neutral throttle to simulate the slight braking effect of a neutral brushed motor while coasting.

1.3. **Low Voltage Cut-Off:** The function prevents the lithium battery pack from over discharging. The ESC detects the battery’s voltage at any time, if the voltage is lower than the threshold for 2 seconds, the output power will be cut off, and the red LED flashes in such a way: “☆-☆-, ☆-☆-, ☆-☆-”.

There are 6 preset options for this item. You can customize the cutoff threshold by using a LCD program box (optional equipment) to trim it with a step of 0.1V, so it will be more suitable for all kinds of batteries (NiMH, NiCd, Li-ion, Lipo, LFP,etc).

1.4. **Start Mode (Also called “Punch”):** Select from “Level1” to “Level9” as your like, Level1 has a very soft start effect, while level9 has a very aggressive start effect. From Level1 to Level9, the start force is increasing. Please note that if you choose “Level7” to “Level9” mode, you must use good quality battery pack with powerful discharge ability, otherwise these modes cannot get the burst start effect as you want. If the motor cannot run smoothly (the motor is trembling), it may caused by the weak discharge ability of the battery pack, please choose a better battery or a softer gear ratio.

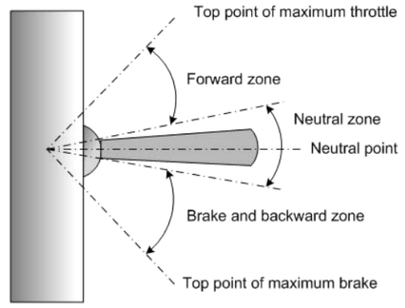
1.5. **Maximum Brake Force:** The ESC provides proportional brake function. The brake force is related to the position of the throttle stick. Maximum brake force refers to the force when the throttle stick is located at the end point of the backward zone. A very large brake force can shorten the brake time, but it may damage the gears. The “Disable” option inhibits the inherent brake function of the speed controller. When this option is selected, the brake function is realized by a traditional mechanical disc-brake system driven by a servo.

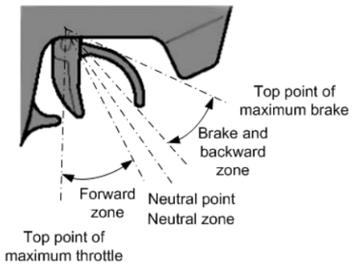
1.6. **Maximum Reverse Force:** Sets how much power will be applied in the reverse direction. Different value makes different reverse speed.

1.7. **Initial Brake Force:** It is also called “minimum brake force”, and it refers to the force when the throttle stick is located at the initial position of the backward zone. The default value is equal to the drag brake force, so the brake effect can be very smoothly.

1.8. **Throttle Neutral Range:** Please refer to the picture on the right side to adjust the neutral range as your like.

1.9. **Timing:** There are many differences among structures and parameters of different brushless motors, so a fixed timing ESC is difficult to compatible with all brushless motors. It is necessary to make the timing value programmable. Please select the most suitable timing value according to the motor you are just using. Generally, higher timing value brings out higher power output, but the whole efficiency of the system will be slightly lower down.





1.10. **Over-Heat Protection:** If the function is activated, the output power will be cut-off when the temperature of the ESC is higher than a factory-preset value for 5 seconds. When the protection happens, the Green LED will flash in such a way: “☆-, ☆-, ☆-”.

1.11. **Motor Rotation:** You can use this item to change the rotation direction. Face to the motor shaft (That means the rear cover of the motor is far from your face), and move the throttle stick to the top point of the forward zone. If this item is set to “CCW”, the shaft runs counter-clockwise; If this item is set to “CW”, the shaft runs clockwise.

1.12. **Lipo Cells:** We strongly suggest setting the “Lipo Cells” item manually because sometimes the default setting “Auto Calculate” will cause mistake. For example, if you are using a discharged 4S Lipo battery, the ESC may mistakenly consider it as a fully charged 3S Lipo battery, and then the “Low voltage cut-off” protection function will be inordinate.

2. Reset All Items To Default Values

At any time when the throttle is located in neutral zone (except in the throttle calibration or parameters program process), hold the “SET” key for over 3 seconds, the red LED and green LED will flash at the same time , which means each programmable item has be reset to its default value.

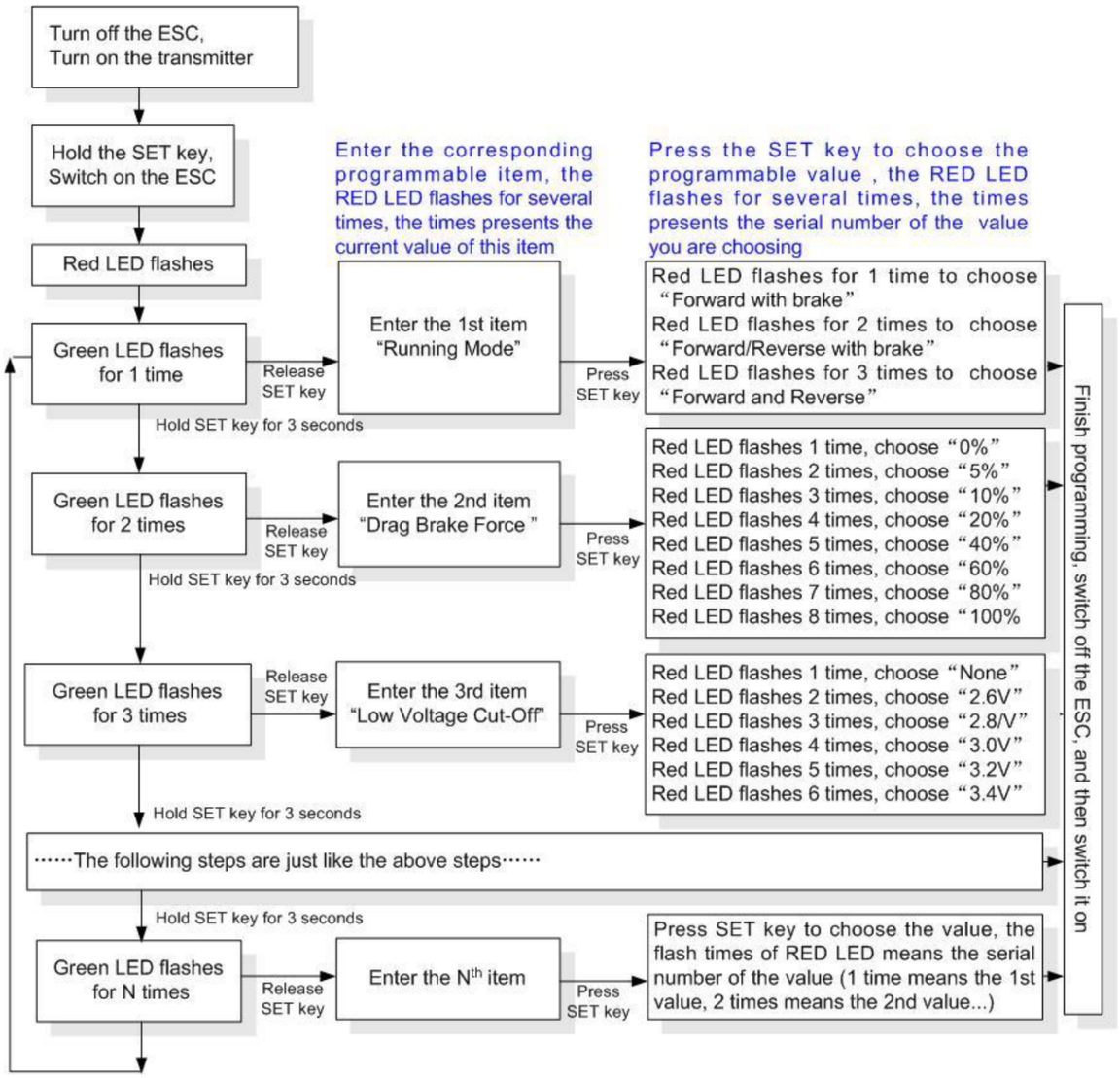
【TROUBLE SHOOTING】

Trouble	Possible Reason	Solution
After power on, motor doesn’t work, and the cooling fan doesn’t work	The connections between battery pack and ESC are not correct	Check the power connections Replace the connectors
After power on, motor can’t work, but emits “beep-beep-, beep-beep-” alert tone. (Every “beep-beep-” has a time interval of 1 second)	Input voltage is abnormal, too high or too low	Check the voltage of the battery pack
After power on, red LED always lights, the motor doesn’t work	Throttle signal is abnormal	Plug the control wire into the throttle channel of the receiver correctly.
The motor runs in the opposite direction when it is accelerated	1)The wire connections between ESC and the motor are not correct 2)The chassis is different from the popular design	Swap any two wire connections between the ESC and the motor. Or change the programmable item #11 (Motor Rotation) to “CW(Clockwise)”
The motor suddenly stops running while in working state	The throttle signal is lost	Check the transmitter and the receiver Check the signal wire from the throttle channel of your receiver
	The ESC has entered the Low Voltage Protection Mode or Over-heat Protection Mode	Red LED flashing means Low Voltage. Green LED flashing means Over-heat
When accelerating quickly, the motor stops or trembles	1) The battery has a bad discharge performance 2) Gear ratio is too aggressive 3) The “Start Mode (Punch)” of the ESC is too aggressive	1) Use a better battery 2) Use lower KV motor or softer gear ratio 3) Set the “Start Mode (Punch)” to a softer value
When the throttle stick is in the neutral range, the red LED and the green LED flashes synchronously	Over current protection, motor demagnetization, or motor is over load	1) Reduce the load (Use softer gear ratio or reduce the input voltage) 2) Change the motor
Cannot connected with the LED Program Card or LCD Program Box	Mistakenly uses the Rx wire to connect to the program card/box.	Connect the program card/box to the special programming port of the ESC, don’t use the Rx wire.

【PROGRAM THE ESC】

1. **Program the ESC with the SET button on the ESC**

Please refer to the following instructions.


Turn off the ESC,
Turn on the transmitter
Hold the SET key,
Switch on the ESC
Red LED flashes
Green LED flashes
for 1 time
Release
SET key
Enter the 1st item
"Running Mode"
Press
SET key
Enter the corresponding programmable item, the RED LED flashes for several times, the times presents the current value of this item
Press the SET key to choose the programmable value , the RED LED flashes for several times, the times presents the serial number of the value you are choosing
Red LED flashes for 1 time to choose "Forward with brake"
Red LED flashes for 2 times to choose "Forward/Reverse with brake"
Red LED flashes for 3 times to choose "Forward and Reverse"
Hold SET key for 3 seconds
Green LED flashes
for 2 times
Release
SET key
Enter the 2nd item
"Drag Brake Force "
Press
SET key
Red LED flashes 1 time, choose "0%"
Red LED flashes 2 times, choose "5%"
Red LED flashes 3 times, choose "10%"
Red LED flashes 4 times, choose "20%"
Red LED flashes 5 times, choose "40%"
Red LED flashes 6 times, choose "60%
Red LED flashes 7 times, choose "80%"
Red LED flashes 8 times, choose "100%
Hold SET key for 3 seconds
Green LED flashes
for 3 times
Release
SET key
Enter the 3rd item
"Low Voltage Cut-Off"
Press
SET key
Red LED flashes 1 time, choose "None"
Red LED flashes 2 times, choose "2.6V"
Red LED flashes 3 times, choose "2.8/V"
Red LED flashes 4 times, choose "3.0V"
Red LED flashes 5 times, choose "3.2V"
Red LED flashes 6 times, choose "3.4V"
Hold SET key for 3 seconds
·····The following steps are just like the above steps·····
Hold SET key for 3 seconds
Green LED flashes
for N times
Release
SET key
Enter the Nth item
Press
SET key
Press SET key to choose the value, the flash times of RED LED means the serial number of the value (1 time means the 1st value, 2 times means the 2nd value...)
Finish programming, switch off the ESC, and then switch it on

Note:

► In the program process, the motor will emit "Beep" tone at the same time when the LED is flashing.

► If the "N" is bigger than the number "5", we use a long time flash and long "Beep---" tone to represent "5", so it is easy to identify the items of the big number.
For example, if the LED flashes as the following:
"A long time flash + a short time flash" (Motor sounds "Beep---B") = the No. 6 item
"A long time flash + 2 short time flash" (Motor sounds "Beep---BB") = the No. 7 item
"A long time flash + 3 short time flash" (Motor sounds "Beep---BBB") = the No. 8 item
And so on.

2. **Program the ESC with the LED program box (Optional equipment) *Note3***

Please refer to the user manual of LED program box.

3. **Program the ESC with the advanced LCD program box (Optional equipment) *Note3***

Please refer to the user manual of LCD program box.

***Note3:* The RX wire of the ESC (for connecting receiver) CANNOT be used to connect with the LED Program Card or LCD Program Box.**
When programming the ESC, please only use the special port between the terminals ABC to connect with program card/box.